

AMENDMENT
USSN: 09/534,034

REMARKS

Claims 2-5 and 7-15 are presently pending. New claims 16 and 17 have been added. Reconsideration and allowance of all claims are respectfully requested in view of the following remarks.

With regard to the status of the present Office Action, although the Examiner checked the box on the Form PTO-326 indicating that the action was final, the undersigned called Examiner Rodriguez on July 16, 2002, and pointed out to him that the indication that the Office Action is final was incorrect since claims 2-4, which were previously indicated as including allowable subject matter, were now rejected over prior art. Examiner Rodriguez agreed with this position and indicated that the indication that the Office Action was final was in fact an error and that he would send out a communication in writing confirming the non-final status of the present Office Action. The undersigned has not yet received written confirmation of the non-final status of the Office Action.

Claims 2-4 stand rejected under 35 U.S.C. § 112, second paragraph, as being indefinite. Although the Examiner's position is overly critical with respect to claims 2, 3 and 4, in lines 1 and 2 thereof, "an optical component" has been changed to instead read --the optical component-- (see Appendix attached).

With respect to the rejection of claims 5 and 15 under § 112, second paragraph, as being indefinite, the undersigned called Examiner Rodriguez on July 17, 2002, and discussed the indefiniteness rejection. Although it is again believed that the Examiner is being overly critical with respect to the language utilized in claims 5 and 15, Examiner Rodriguez indicated that

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amending claims 5 and 15 to delete the wherein clause, i.e., “wherein the optical component is a component of a solid state laser apparatus” and insert therefor --wherein the step of bringing the optical component into close contact with the scored surface of the support further comprises bringing a solid state laser apparatus component into close contact with the scored surface-- should overcome the rejection under § 112, second paragraph. However, Examiner Rodriguez indicated that he would need to reconsider the language again upon submission in a formal Amendment.

Unfortunately, the Examiner has now rejected all of the pending claims 2-5 and 7-15 under 35 U.S.C. § 103(a) as being unpatentable over the newly cited U.S. published patent application No. U.S. 2001/0053167 A1 (Kitaoka et al.). For the following reasons, this rejection is respectfully traversed.

Turning to the obviousness rejection, the Examiner relies on FIG. 16 of Kitaoka and maintains that this figure illustrates a laser system having a submount 201 with grooves 202 filled with adhesive 206, where a planar optical waveguide 204 is fixed (referencing Example 9, page 12, paragraphs [0162] - [0169]). The Examiner acknowledges that Kitaoka fails to disclose the particular dimensions of the pitch, depth or flatness of the groove, but maintains that one of ordinary skill “has the capability of understanding the scientific and engineering principles applicable to the claimed invention” and thus “discovering working ranges of the dimensions of the pitch, depth and flatness involves only routine skill in the art.” The Examiner concludes that it would have been obvious to one of ordinary skill to provide working ranges or optimum ranges for the pitch, depth and flatness of the groove in the laser system of Kitaoka because it would enhance adhesion of the optical element.

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In FIGs. 15 and 16, Kitaoka discloses an optical integrated device wherein grooves 202 are provided in a region of the surface of a submount 201 where a planar type optical waveguide element 204 is fixed.

Referencing FIG. 16, adhesive 206 for fixation is injected into grooves 202. The adhesive may be UV curable type adhesive. Further, clearance grooves may be provided adjacent to each of the grooves 202 to allow the excess amount of adhesive to flow therein at the time of mounting.

However, in Kitaoka grooves are formed on a polished surface of a silicon submount by etching, resulting in high cost. On the other hand, the present invention employs kerfs on an unpolished support, which are automatically generated when the support is scored. Thus, the cost for the processing is lower than that in the case of the newly cited reference in which grooves are formed on a polished surface. Further, as the Examiner has correctly pointed out, the reference fails to disclose the particular dimensions of the pitch, depth or flatness of the grooves, and such dimensions would be expected to be different between the present invention and the reference. Therefore, the present invention is patentably distinct from Kitaoka in terms of the background underlying the invention and the feature.

In particular, the Example 9 described on pages 12 and 13 of Kitaoka does not include any specific dimensions regarding the pitch, depth and flatness, while the previous Example 8 described on pages 10 and 11 indicates that a distance between two adjacent grooves is equally set to be 10 μm (see paragraph [0142]), and the depth of each of the grooves is about 5 μm (see paragraph [0139]). No information appears to be given with respect to the flatness.

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Based on the foregoing, Kitaoka discloses grooves and not kerfs formed by scoring, and, in any case, the Kitaoka groove depth of 5 μm is outside the Applicants' recited range of 0.1 μm to 1 μm , and Kitaoka is silent with respect to the flatness of the support (i.e., submount 201) being 1 μm or less.

With respect to claims 2 and 7, Kitaoka discloses a distance between adjacent grooves and not a pitch value of scoring kerfs in the recited range.

With respect to dependent claims 5 and 10-15, these claims are patentable at least by virtue of their dependency on the respective independent claims.

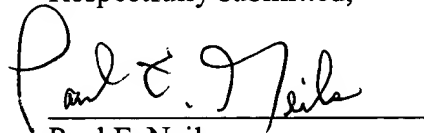
In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

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Respectfully submitted,

A handwritten signature in black ink, appearing to read "Paul F. Neils", written over a horizontal line.

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APPENDIX

VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE CLAIMS:

The claims are amended as follows:

2. (Twice Amended) An optical component fixing method using an adhesive to fix [an] the optical component and a support on which the optical component is to be fixed at a prescribed location, the method comprising:

a step of scoring a surface of the support;

a step of bringing the optical component into close contact with the scored surface of the support; and

a step of flowing a fluid adhesive along kerfs produced by the scoring,

wherein the scoring kerfs are formed at a pitch of 3 μm - 300 μm .

3. (Twice Amended) An optical component fixing method using an adhesive to fix [an] the optical component and a support on which the optical component is to be fixed at a prescribed location, the method comprising:

a step of scoring a surface of the support;

a step of bringing the optical component into close contact with the scored surface of the support; and

a step of flowing a fluid adhesive along kerfs produced by the scoring,

wherein the scoring kerfs are formed to a depth of 0.1 μm - 1 μm .

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4. (Twice Amended) An optical component fixing method using an adhesive to fix [an] the optical component and a support on which the optical component is to be fixed at a prescribed location, the method comprising:

a step of scoring a surface of the support;

a step of bringing the optical component into close contact with the scored surface of the support; and

a step of flowing a fluid adhesive along kerfs produced by the scoring,

wherein an attachment surface of the support has a flatness of 1 μm or less.

5. (Twice Amended) An optical component fixing method according to any one of claims 2 to 4, [wherein the optical component is a component of a solid state laser apparatus] wherein the step of bringing the optical component into close contact with the scored surface of the support further comprises bringing a solid state laser apparatus component into close contact with the scored surface.

15. (Amended) An optical component fixing method according to any one of claims 12 to 14, [wherein the optical component is a component of a solid state laser apparatus] wherein the step of bringing the optical component into close contact with the scored surface of the support further comprises bringing a solid state laser apparatus component into close contact with the scored surface.

Claims 16 and 17 are added as new claims.